



# Microbiological Water Sampling for Recreational / Environmental Waters

To determine the microbiological quality of environmental water, it should be sampled and tested in accordance with the following:

- AS/NZS 5667.1:1998 Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples.
- AS 2031-2012 Water Quality – Sampling for microbiological analysis.

## General Rules of Sampling

There are several important points to remember when taking environmental water samples. Aseptic technique is essential to avoid contaminating the sample container and the water sample.

If there is any reason to suspect that contamination has occurred during sampling, discard the sample and take another in a fresh bottle.

### Do Not:

- ✗ Touch the inside of the bottle, or the inside rim of the bottle or lid.
- ✗ Rinse the bottle.
- ✗ Put the bottle lid on the ground while sampling.
- ✗ Collect replicate samples from the exact same location,
- ✗ Transport environmental water samples in the same container/esky as other water samples, e.g.: sewage or drinking water.

### Always:

- ✓ Use a clean, sterile bottle.
- ✓ Label the bottle before sampling.
- ✓ Wash your hands thoroughly before and after collecting samples suspected of containing faecal material.
- ✓ Collect microbiological samples before collecting other samples.
- ✓ Collect replicate samples several metres apart – this will prevent the sample being contaminated by disturbed sediments and the sampler.
- ✓ Discard damaged or contaminated bottles. If in doubt throw it out and take another sample in a new bottle.

**Only remove the bottle from the plastic bag to complete the label details and when it is time to sample.**

## Sampling Bottle Labelling

Prior to taking a sample the following information should be clearly written on all sample bottles:

- Sender reference number
- Site code: e.g. EV3/999
- Point of collection i.e. Name of water body / Sample point name / Location description
- Source e.g. Type of water body e.g. ocean/marine, river/estuarine/fresh etc.
- Date and time of collection
- Transport temperature: (bacteriological 4°C) OR (amoeba ambient)
- Sampling agency or company name

**NOTE:** Use a waterproof pen when marking sample bottles so the information will not rub off in the water.



## Sample Collection Procedure

1. Take a labelled sterile sample bottle. Make sure you keep the lid on the bottle until you are ready to collect the sample.
2. Move to the sample location and wade at least knee deep into the water, trying to avoid stirring up the sediment.
3. Hold the sterile bottle in one hand near the base, and carefully remove and hold the screw cap with the end finger of your other hand. Be careful not to touch the inside of the screwcap when sampling. OR

Place the sampling bottle into the sampling pole, making sure it is securely clamped into position. Carefully remove and hold the screw cap with your end finger of your free hand. Extend the pole out into the water.

**Note:** Use a sampling pole if it is not practical to wade into the water, or if the water is very turbulent, or there are any other physical or other hazards associated with the water body.

4. Collect the sample from approximately 300 mm below the water surface, moving the bottle away from your body. Take care to avoid any surface film entering the bottle by plunging it, neck downwards as it enters the water.
5. Turn the bottle until the neck points slightly upwards while moving it in the direction of the mouth during filling. Create an artificial current by pushing the bottle horizontally forwards

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away from the hand. Care should be taken to ensure that the bottle fills before the forward motion is complete. This prevents contamination from the samplers' hand entering the bottle.

6. Fill the bottle almost to the top, leaving an air gap of approximately 1-2 cm, OR  
If the bottle is full to the top after removing it from the water, tip or shake a little bit of water from the top of the bottle to leave an air gap of about 1-2 cm from the rim of the bottle.  
**Note:** This air gap is necessary to facilitate mixing of the sample in the laboratory.
7. Carefully replace the screwcap immediately and firmly.
8. Store and transport in accordance with '[Sample transportation](#)'.

## Sample Transportation

### Bacteriological samples

Place the sample in an insulated container with enough pre-chilled ice bricks or artificial ice packs to maintain a temperature of 2-6°C during transportation. Loose ice should only be used if melted ice can be prevented from entering sample containers e.g. use of zip-lock, water-tight bags.

Samples should be kept in the dark and maintained as cool as possible and received at the laboratory as soon as possible but within 24 hours after collection.

**Note:** Chilled temperatures help prevent bacteria multiplying and false bacterial counts.

### Amoeba samples

Water samples for amoeba testing shall be transported in an insulated container at ambient (not chilled) temperature. The container must not contain ice-bricks or be chilled, as chilling the sample will kill any viable amoebae. Samples should be received in the laboratory no more than 96 hours after sampling.

### Other samples

For other microbiological sample types, refer to AS2031-2012 for sample transport times and storage recommendations.

## Submitting Samples

**Note:** The following information has been provided for samples sent to PathWest for analysis. If the sample is being submitted to a private laboratory, refer to the chosen laboratory for advice on correctly completing the sample bottle details and accompanying analysis request form.

It is essential that all samples be given a site code number before they are submitted for analysis. For more information regarding site code allocation contact the Department of Health for reference to the publication: [Site Code Identification System for Water Samples](#).

**Note:** Always inform the laboratory if you suspect the samples are contaminated by faecal material.


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## Chain of custody form



The chain of custody documentation should be supplied by the analytical laboratory. This is used to ensure the details of the sampling can always be traced. The person collecting the samples must fill out this form (see PathWest form below).



**PathWest**  
LABORATORY MEDICINE WA

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Environmental Microbiological Unit  
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**WATERS EXAMINATION LABORATORY  
REQUEST FORM**

NATA  
Corporate Accreditation No. 2392  
NATA Accreditation No. 2861

<p>Company Name: <input style="width: 95%;" type="text"/></p> <p>Address: <input style="width: 95%;" type="text"/></p> <p>Contact Name: <input style="width: 45%;" type="text"/> Phone Number: <input style="width: 45%;" type="text"/></p> <p>Contact Email: <input style="width: 95%;" type="text"/></p> <p>Date Sampled: <input style="width: 45%;" type="text"/> Signed: <input style="width: 45%;" type="text"/></p> <p>Purchase Order Number: <input style="width: 95%;" type="text"/></p>	<div style="font-size: x-small;"> <input type="checkbox"/> Drinking Water (source to Consumer)  <input type="checkbox"/> Reverse Osmosis Water (RO Water)  <input type="checkbox"/> Bottled Water, Ice  <input type="checkbox"/> Pools <input type="checkbox"/> Spas <input type="checkbox"/> Hydros <input type="checkbox"/> Float Tanks  <input type="checkbox"/> Natural Waters (Fresh)  <input type="checkbox"/> Natural Waters (Marine)  <input type="checkbox"/> Sewage / Wastewater Recycled water  <input type="checkbox"/> Air conditioning / Cooling Towers  <input type="checkbox"/> Other (specify) <input style="width: 100%;" type="text"/> </div>	<p>Additional Sample Comments:</p> <div style="border: 1px solid black; height: 100px;"></div> <p>Specify Tests Required:</p> <div style="border: 1px solid black; height: 30px;"></div>
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LABORATORY USE ONLY	SAMPLE DETAILS				TREATMENT				SAMPLE SUBMITTED (please tick)		LABORATORY USE ONLY	
Laboratory Number	Site Code	Description	Time Sampled	Temp (°C)	Type (Cl, Br, etc.)	ppm	pH	Bacteria (chilled)	Amoebae (ambient)	Bacteria set up by / Date:	Amoebae set up by / Date:	
								<input type="checkbox"/>	<input type="checkbox"/>			
								<input type="checkbox"/>	<input type="checkbox"/>			
								<input type="checkbox"/>	<input type="checkbox"/>			
								<input type="checkbox"/>	<input type="checkbox"/>			
								<input type="checkbox"/>	<input type="checkbox"/>			
								<input type="checkbox"/>	<input type="checkbox"/>			

Samples Received By:	Temperature ("chilled"):	Laboratory Comments:	Report Type:
Receival Date:	Temperature (amoeba):		Authorized By:
			Date:
			Emailed:

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## Site Observation Details

It is important to take accurate records when conducting field sampling. Recording site details and environmental factors can assist with understanding and interpreting the sample results. It is suggested that field notes include the following details:

- Date
- Time of sampling
- Site name/description
- Site codes

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Also record environmental factors such as;

- Rainfall in the past 24-48 hours
- Approximate number of bathers in the water
- Water clarity (visual clarity in the water)
- Weather conditions (temperature, cloud cover)
- Presence of animals (domestic and wild animals)
- Stormwater flow
- Presence of algae or algal blooms
- Surface Films (oils and petrochemicals)
- Wind strength
- Wind direction
- Other comments (e.g. number of bather’s present, boats, anglers)

See [Field Observation Form for Recreational Water Sampling](#) below.



Government of Western Australia  
Department of Health

## Field Observation Form for Recreational Water Sampling

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Samplers Name: \_\_\_\_\_

Today's Weather: \_\_\_\_\_ Temp: \_\_\_\_\_

Rain in past: 24 hours? **Yes / No** 48 hours? **Yes / No**

Site Code	Site Name	Water Body Type: (O, R, L...)	Time	Wind Direction (N, E, S, W etc.)	Wind Speed (0-4) or (km/h)	Tide: (H, M, L) Or (m)	Water Cond: Calm/ Med/ Rough	Water Clarity (1-5) 1= very clear, or (m)	** Turbidity (NTU)	Water Temp °C	** pH	** EC (µS/cm)	** TDS (mg/L)	Algae (Y/N)	Drain Flowing (Y/N)	~ No. Birds	No. Dogs	Other Animal Type (Y/N)	~ No. Bathers	~ No. People on Beach	No. Boats	Comments

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## More Information:

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